

THE TAXONOMIC POSITION OF THE NEW ZEALAND GENUS
PROSOCHAETA MALLOCH (DIPTERA: SCIOMYZIDAE)¹

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Abstract.—The monotypic New Zealand genus *Prosochaeta* Malloch is redescribed incorporating morphological characters of the abdomens of the male and female. *Prosochaeta* is placed in a new tribe, **Prosochaetini**, and the definition of the subfamily Huttonininae Steyskal (Diptera: Sciomyzidae) is expanded to receive this tribe. The relationships of *Prosochaeta* and the other Huttonininae to other sciomyzid taxa are discussed.

The taxonomic position of the monotypic New Zealand genus *Prosochaeta* Malloch has never been satisfactorily determined. Malloch (1935) referred it to the Sciomyzidae. Harrison (1959) retained it in the Sciomyzidae and considered it to be most closely related to the New Zealand genus *Xenosciomyza* Tonnoir and Malloch. Steyskal (1965) did not include *Prosochaeta prima* Malloch in his subfamily classification of the Sciomyzidae because he was unable to examine sufficient material. Griffiths (1972) removed *Prosochaeta* from the Sciomyzidae and referred it to his new family Helosciomyzidae along with *Huttonina* Tonnoir and Malloch, *Helosciomyza* Hendel, *Xenosciomyza*, and *Polytocus* Lamb. I have examined male and female specimens of *Prosochaeta prima*, and I believe that the following revised generic definition lists the attributes that are most important for characterizing the genus and for determining its taxonomic position.

The following abbreviations are used for institutions holding specimens: AIM = Auckland Institute and Museum, Auckland, New Zealand; ATI = Abteilung Taxonomie der Insekten, Institut für Pflanzenschutzforschung, Eberswalde, German Democratic Republic; CU = Cornell University, Ithaca, New York, U.S.A.; FRI = Forest Research Institute, Rotorua, New

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Zealand; MAF = Ministry of Agriculture and Fisheries, Levin, New Zealand; NZNAC = National Arthropod Collection, Department of Scientific and Industrial Research, Auckland, New Zealand; NZNM = National Museum, Wellington, New Zealand.

Prosochaeta Malloch

Prosochaeta Malloch, 1935:95 [type-species: *Prosochaeta prima* Malloch, by monotypy]; Harrison, 1959:37.

Arista pubescent, arising near apex of 3rd antennal segment. Antenna short. Lunule largely concealed. Three fronto-orbital bristles present; 2 anterior bristles somewhat proclinate; posterior bristle somewhat reclinate. Ocellar bristles weak. Postvertical bristles short and parallel to slightly convergent. Face concave. Oral vibrissae absent. Clypeus visible in profile when proboscis withdrawn, not separated from epistoma by large membranous area.

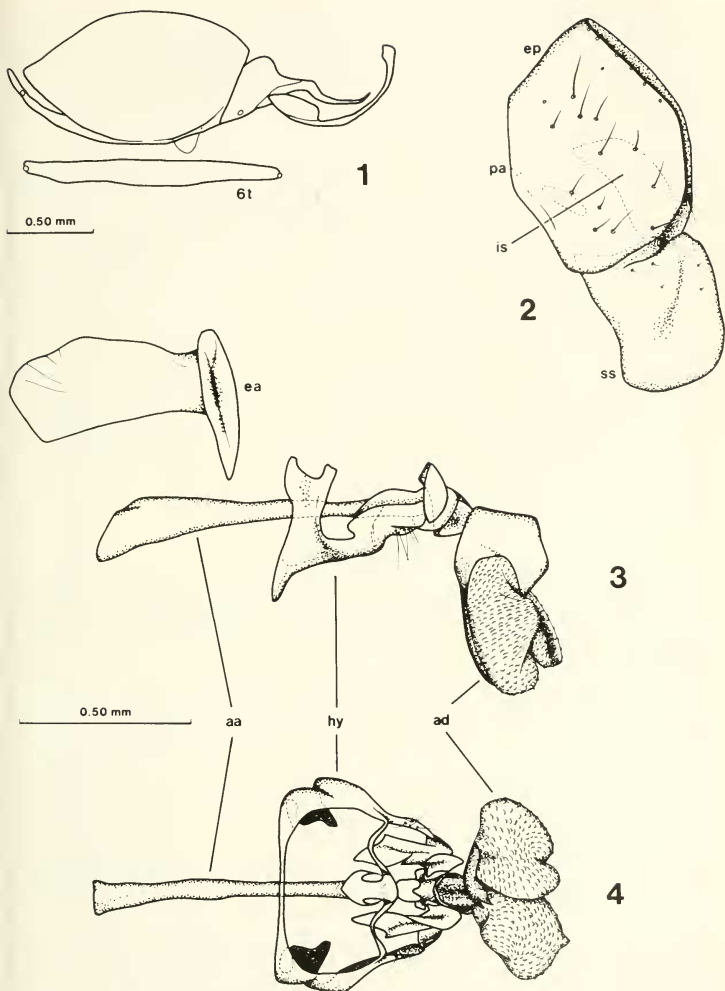
Mesonotum setulose, with 1 humeral, 2 notopleural, 1 supra-alar, 2 postalar, 1 dorsocentral bristle; presutural bristles absent. Scutellum with 1 lateral and 1 apical bristle, otherwise bare. Propleural bristle well developed. Mesopleuron with scattered, fine setae posteriorly. Pteropleuron and hypopleuron bare. Sternopleural bristles present. Prosternum bare, free from propleuron.

Costa and subcosta complete. Costa without rows of strong spines. Anal [basal cubital] cell with acute dorso-apical angle and distinctly obtuse ventro-apical angle [see Malloch (1935, Fig. 2) and Harrison (1959, Fig. 43) for wing venation]. Anal vein abruptly terminated about three-quarters distance to wing margin. Femora simple, without strong bristles or spines. Tibiae simple, with pre-apical dorsal bristles.

Suture between 1st and 2nd abdominal segments indistinct.

Male.—Abdominal spiracles 2 to 5 situated within respective tergites, at lateral margins. Postabdomen asymmetrical. Protandrium as in Fig. 1. Sixth tergite nearly symmetrical, narrow, about $\frac{1}{4}$ length of 5th tergite, not fused to protandrium. Vestige of 7th tergite represented by a narrow band fused to anterior end of 8th sternite [dorsal sclerite of 8th segment; see Griffiths (1972:51)]. Vestige of 8th tergite absent. Sixth sternite narrow, best developed on left side where it is closely approximated to 7th sternite. Seventh sternite narrow, best developed on left side where it is fused to 8th sternite. Sixth spiracles at lateral margins of 6th tergite. Seventh right spiracle situated within 7th tergite; 7th left spiracle situated within 7th sternite; left spiracle displaced dorsally and right spiracle displaced ventrally with respect to corresponding 6th-segment spiracles. [Hennig (1958, Fig. 125) incorrectly showed the 6th and 7th right spiracles completely within the membrane.]

Andrium and proctiger as in Fig. 2. Epandrium bearing 1 pair of discrete, movable surstyli with sparse, fine setae on inner and outer surfaces. Internal



Figs. 1-4. *Prosochaeta prima*, male. 1, Protandrium, dorsal view, drawn as if split ventrally and laid flat. 2, Andrium and proctiger, lateral view. 3-4, Hypandrium, aedeagus, and associated structures, lateral and anteroventral view, respectively. Figures 2, 3, and 4 same scale. Abbreviations: aa, aedeagal apodeme; ad, aedeagus; ea, ejaculatory apodeme; ep, epandrium; hy, hypandrium; is, internal sclerotized plate; pa, point of attachment between hypandrium and epandrium; ss, surstylus; 6t, 6th tergite.

sclerotized plate [interparameral sclerotization; Griffiths (1972:35)] present, extending from bases of surstyli and posteroventral edge of epandrium over inner copulatory apparatus and linked with hypandrium on left and right sides. Cerci scarcely differentiated; a few fine setae present on posteroventral edge of epandrium between surstyli.

Hypandrium, aedeagus, and associated structures as in Figs. 3 and 4. Hypandrium nearly symmetrical, with a few fine setae posteroventrally. Ejaculatory apodeme large, flattened, fan-shaped anteriorly. Aedeagal apodeme long, rodlike, linked to hypandrium by 2 long, narrow arms extending between posterior end of aedeagal apodeme and inside ventral margins of hypandrium. Aedeagus large, asymmetrical, bilobed, mainly membranous, densely covered with fine scale-like structures, able to be swung through wide arc against aedeagal apodeme to anteriorly directed rest position.

Female.—Abdominal spiracles 2 and 3 in respective tergites, at lateral margins. Abdomen posterior to segment 3 as in Figs. 5 and 6. Fourth and 5th terga membranous; 4th and 5th spiracles displaced dorsally. Sixth and 7th tergites and sternites fused to form 2 completely annular somites; 6th and 7th spiracles well within respective sclerites. Two spermathecal ducts present, each with 2 apical spermathecae, as in Fig. 7.

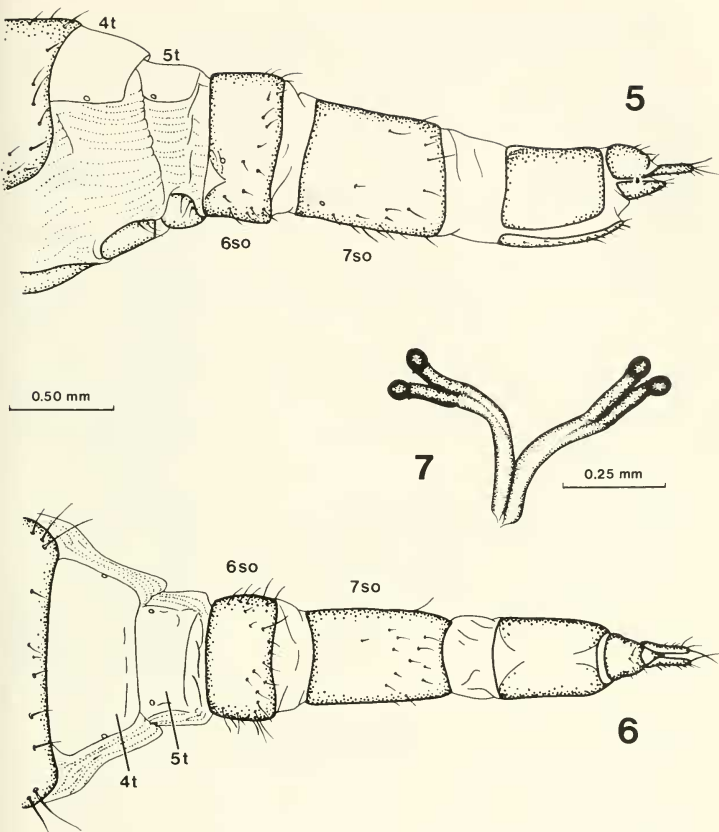
Immature stages.—Unknown.

Prosochaeta prima Malloch

Prosochaeta prima Malloch, 1935:95–96, plate XIV, figs. 1–2 [holotype: Auckland, New Zealand; Abteilung Taxonomie der Insekten, Institut für Pflanzenschutzforschung, Eberswalde, German Democratic Republic]; Harrison, 1959:37, 39, figs. 43, 46, 47, 52.

I have not attempted to redescribe the species because this would only duplicate the accurate descriptions given by Malloch (1935) and Harrison (1959). The holotype and other specimens agree well with these descriptions.

Specimens examined.—*North Island*. Auckland, ♂, holotype, coll. Oldenberg, coll. Osten Sacken, ATI. Titirangi; 27.xii.1942, ♀; -.iv.1947, ♀; M. W. Carter, NZNAC. Huia, in house, 8.i.1967; ♂, CU; ♀, NZNAC; B. M. May. Kaimanawa North State Forest 90, 10.i.-, ♀, Anon., FRI. Ohakune, ♀, J. W. Campbell, CU. Between Kakatahi and Ohakune, in car, 20.i.1974, ♀, L. G. Morrison, MAF. Kaitawa, 19.xii.1922, sex unknown, Ethel Richardson, NZNM. *South Island*. Nelson, Belton, 20.xii.1940, ♀, E. S. Gourlay, CU. Mt. Arthur, Gordon's Pk., 2.iii.1927, ♀. A. Philpott, NZNAC. Nelson Lakes National Park, L. Rotoiti, Kerr Bay Motor Camp, 9.iii.1977, ♀, J. K. Barnes, CU. Greymouth; ♂, coll. Lichtwardt, ATI; sex unknown, coll. Osten Sacken, coll. Oldenberg, ATI. Christchurch, Dyer's Pass, 29.i.1924, ♀, Anon., AIM. Otago, ♀, coll. Lichtwardt, ATI. No data; ♂, coll. Miller, NZNAC; ♀, coll. Oldenberg, coll. Osten Sacken, ATI.



Figs. 5-7. *Prosochaeta prima*, female. 5-6, Abdomen posterior to segment 3, lateral and dorsal view, respectively. 7, Spermathecae and ducts. Figures 5 and 6 same scale. Abbreviations: 4t, 4th tergum; 5t, 5th tergum; 6so, 6th somite; 7so, 7th somite.

The female that I collected was taken from a marshy area of *Sphagnum* and *Carex* surrounded by *Nothofagus* forest by beating the vegetation with an insect net.

THE TAXONOMIC POSITION OF *PROSOCHAETA*

A summary of the distribution of some characters of the five subfamilies of Sciomyzidae (*sensu* Steyskal) and *Prosochaeta* is presented in Table 1.

Characters						
	<i>Prosochaeta</i>	Huttoninae	Helosciomyzinae	Phaeomyiinae	Salticellinae	Sciomyzinae
1. Arista preapical (+); not preapical (-)	■	□	□	□	□	▨
2. Clypeus small (+); large (-)	□	□	■	■	■	■
3. Postverticals parallel or convergent (+); divergent (-)	■	■	□	□	□	□
4. Propleural bristle absent (+); present (-)	□	□	□	□	■	▨
5. Costa spinose (+); not spinose (-)	□	□	■	□	□	□
6. Ventoapical angle anal cell distinctly obtuse (+); otherwise;	■	■	□	□	□	□
7. Anal vein abbreviated (+); complete (-)	■	■	□	□	□	▨
8. Suture on abdominal tergites 1 + 2 indistinct (+); distinct (-)	■	■	□	□	□	□
9. Abdominal spiracles 2-5 in tergites (+); in membrane (-)	■	□	□	□	□	□
10. ♂ 6th tergite fused to protandrium (+); free (-)	□	■	□	□	□	▨
11. ♂ 7th left spiracle in 7th sternite (+); in membrane (-)	■	■	■	■	■	▨
12. Anteroventral corner epandrium extended (+); not extended (-)	□	□	▨	□	□	□
13. Surstyli fused to epandrium (+); free (-)	□	■	□	□	□	□
14. Aedeagus bilobed, membranous, scaled (+); otherwise (-)	■	■	□	□	□	□
15. ♀ 4th and 5th terga membranous, (+); sclerotized (-)	■	□	□	□	□	□
16. ♀ 6th abdominal tergite and sternite fused (+); separate (-)	■	□	□	□	□	□
17. ♀ 7th abdominal tergite and sternite fused (+); separate (-)	■	■	□	□	□	□
18. ♀ 6th abdominal spiracle in sclerite (+); in membrane (-)	■	□	□	□	□	▨
19. ♀ 7th abdominal spiracle in sclerite (+); in membrane (-)	■	■	□	□	□	▨
20. Number of spermathecae	4	3	3	3	4	2

■ = +

□ = -

▨ = Character found in some, but not all, species

Table 1. Distribution of some characters in *Prosochaeta* and the subfamilies of Sciomyzidae *sensu* Steyskal.

The black rectangles indicate characters that are interpreted as apomorphic groundplan conditions of the given taxon. Plesiomorphic groundplan conditions are indicated by white rectangles. If an apomorphic character is present in some, but not all, members of a taxon, and it therefore may or may not be interpreted as an apomorphic groundplan condition, it is indicated by a cross-hatched rectangle.

Prosochaeta shares more apomorphic groundplan characters with the monotypic New Zealand subfamily Huttonininae than it does with any other subfamily of the Sciomyzidae. The following characters, interpreted as apomorphic with respect to the groundplan of the Sciomyzoidea and Scio-

myzidae, are apparently sufficient to establish the taxon consisting of the genera *Prosochaeta* and *Huttonina* as a monophyletic group:

- (1) Postvertical bristles short and parallel or slightly convergent;

Steyskal (1965) characterized the Helosciomyzinae as also having parallel or slightly *convergent* postverticals. My observations of the New Zealand species of *Helosciomyza*, *Xenosciomyza*, and *Polytocus* indicate that the trend toward convergence is poorly defined. Indeed, I believe the Helosciomyzinae should be characterized as having postverticals parallel to slightly *divergent*. The postverticals are also long and well developed in the Helosciomyzinae. It is unlikely that the condition of the postverticals in *Prosochaeta*, *Huttonina*, and the Helosciomyzinae can be attributed to synapomorphy.

- (2) Anal [basal cubital] cell enclosed by a curved cross vein forming an acute dorso-apical angle and a distinctly obtuse ventro-apical angle (see Tonnoir and Malloch, 1928, Fig. 27; Malloch, 1935, Fig. 2; Harrison, 1959, Figs. 43, 58–64);

- (3) Anal vein abruptly terminated about three-quarters distance to wing margin;

The anal vein is also abbreviated in *Colobaea* Zetterstedt, *Parectinocera* Becker, and a few species of *Pherbellia* Robineau-Desvoidy (Sciomyzinae: Sciomyzini), but it is unlikely that this is due to synapomorphy with *Prosochaeta* and *Huttonina* because most members of the Sciomyzini have the more plesiomorphous condition of a complete anal vein.

- (4) Suture between 1st and 2nd abdominal segments indistinct;

Among the families of Sciomyzoidea this character is also found in the Dryomyzidae and Sepsidae, according to McAlpine (1963, Table 1).

- (5) Aedeagus bilobed, mainly membranous, covered with fine scale-like structures;

Griffiths (1972) used the presence of a bilobed aedeagus to support placement of *Prosochaeta* and *Huttonina* in his family Helosciomyzidae, along with *Helosciomyza*, *Xenosciomyza*, and *Polytocus*. I have examined the aedeagi of all New Zealand species of the latter three genera. In most species they cannot be characterized as bilobed, they are not membranous, and they are not covered with fine scale-like structures.

- (6) Female with 7th abdominal tergite and sternite fused to form a completely annular somite; 7th abdominal spiracle well within the sclerotization of this somite.

A character that is interpreted as plesiomorphous with respect to the groundplan conditions of the Sciomyzoidea and Sciomyzidae and occurs in one or both of the genera *Prosochaeta* and *Huttonina* is considered a ple-

siomorphic groundplan condition of the taxon consisting of *Prosochaeta* and *Huttonina*. Among these are the following: Arista not pre-apical, clypeus not reduced, propleural bristle present (but much reduced in *Huttonina*), costa not spinose, abdominal spiracles 2 to 5 in membrane, male with 6th tergite free, anteroventral corner of epandrium not extended, surstyli unilobate and movable, female with 4th and 5th terga not membranous, female with 6th tergite and sternite separate, female with 6th abdominal spiracles in membrane, spermathecae 2+1.

Prosochaeta also possesses several apomorphic characters that are not interpreted as groundplan conditions for any family of Sciomyzoidea nor, in most cases, for any previously characterized subfamily of the Sciomyzidae, including the Huttonininae:

- (1) Arista pre-apical;

Tetanura Fallén (Sciomyzinae: Sciomyzini) also has a pre-apical arista, but this condition cannot be interpreted as a synapomorphy.

- (2) Female with 4th and 5th terga membranous, and corresponding spiracles displaced dorsally;
- (3) Female with 6th tergite and sternite fused, forming completely annular 6th somite;
- (4) Spermathecae 2+2.

Two apical spermathecae on each of two spermathecal ducts can also be found in *Salticella fasciata* (Meigen) (Salticellinae). It is unlikely that this can be interpreted as a synapomorphic condition of *Prosochaeta* and *Salticella* Robineau-Desvoidy because there is little other evidence to indicate that these genera are monophyletic. The four spermathecae of *Prosochaeta* probably arose from the condition of three spermathecae as found in *Huttonina* and in the presumed groundplan of the Schizophora (Hennig, 1958), whereas the four spermathecae of *Salticella* may have arisen from either the two-spermathecal condition of the groundplan of the Sciomyzinae or from the more plesiomorphic three-spermathecal condition (Hennig, 1965).

It is apparent from the above discussion that *Huttonina* may be regarded as the sister-genus of *Prosochaeta*. However, these two genera differ in several important features, and they should be referred to different higher taxa of at least tribal rank. On the other hand, assigning them to separate subfamilies of the Sciomyzidae may only serve to confuse further the taxonomic relationships within a family whose higher taxonomy is not yet well understood. I have therefore chosen to expand the definition of the subfamily Huttonininae to include *Prosochaeta* and to describe a new tribe to receive this genus.

Huttonininae Steyskal

Huttonininae Steyskal, 1965:593 [type-genus: *Huttonina* Tonnoir and Malloch, by monotypy].

Arista pubescent and sometimes arising near apex of 3rd antennal segment. Antenna short. Lunule largely concealed. Two or 3 fronto-orbital bristles present. Ocellar bristles weak. Postvertical bristles weak and parallel to slightly convergent. Face concave. Oral vibrissae absent. Clypeus well developed, not separated from epistoma by large membranous area, visible in profile when proboscis withdrawn.

Mesonotum setulose. Presutural bristles and presutural dorsocentral bristles present or absent; 1 or more postsutural dorsocentrals present; prescutellar acrostichal bristles absent; 1 humeral, 2 notopleural, 1 supra-alar, 2 postalar bristles present. Scutellum with 1 lateral and 1 apical bristle, otherwise bare or setulose. Propleural bristle well developed or minute. Mesopleuron setulose. Pteropleuron and hypopleuron bare. Sternopleuron with 1, 2, or 3 strong bristles. Metastigmatal bristles absent. Prosternum bare, free from propleuron.

Wings hyaline or with brown pattern. Costa and subcosta complete; costa without rows of strong spines. Anal [basal cubital] cell enclosed by curved cross vein forming acute dorso-apical angle and distinctly obtuse ventro-apical angle. Anal vein abruptly terminated about three-quarters distance to wing margin. Femora simple, without strong bristles or spines. Tibiae simple, with pre-apical dorsal bristles.

Suture between 1st and 2nd abdominal segments indistinct. Abdominal spiracles 2 to 5 situated within membrane or within respective tergites, at lateral margins.

Male.—Postabdomen asymmetrical. Sixth tergite narrow, free or fused to protandrium. Vestige of 7th tergite present or absent. Vestige of 8th tergite absent. Sixth and 7th sternites narrow, better developed on left side. Seventh sternite fused to 8th sternite on left side. Sixth spiracles situated within membrane, within sclerotization of protandrium, or at lateral margins of 6th tergite. Seventh left spiracle situated within 7th sternite, displaced dorsally with respect to 6th left spiracle. Seventh right spiracle situated within sclerotization of protandrium, displaced ventrally with respect to 6th right spiracle. Epandrium bearing 1 pair simple, lobulate surstyli, movable or fused to epandrium. Internal sclerotized plate [interparameral sclerotization; Griffiths (1972:35)] present, extending from bases of surstyli and posteroventral edge of epandrium over inner copulatory apparatus and linking with hypandrium on left and right sides. Cerci small. Hypandrium nearly symmetrical, with a few fine setae posteroventrally. Aedeagal apodeme long, rodlike, linked to hypandrium by 2 long, narrow arms extending between posterior

end of aedeagal apodeme and inside ventral margins of hypandrium. Aedeagus asymmetrical, bilobed, mainly membranous, covered with fine scale-like structures, able to be swung through wide arc against aedeagal apodeme to anteriorly directed rest position.

Female.—Fourth and 5th terga membranous or sclerotized. Seventh tergite and sternite fused to form completely annular 7th somite; 6th tergite and sternite fused or separate; 6th and 7th spiracles situated within sclerotization of annular somite or in membrane. Spermathecae 2+1 or 2+2.

Immature stages.—Unknown.

KEY TO THE TRIBES OF HUTTONININAE

- Arista not pre-apical. Propleural bristle not well developed. Abdominal spiracles 2 to 5 in membrane. Male 6th tergite fused to protandrium; surstyli not movable, fused to epandrium or delimited only by a partial suture. Female 4th and 5th terga sclerotized; 6th abdominal tergite and sternite separate; spermathecae 2+1 Tribe Huttoninini Steyskal
- Arista pre-apical. Propleural bristle well developed. Abdominal spiracles 2 to 5 in respective tergites, at lateral margins. Male 6th tergite not fused to protandrium; surstyli movable, not fused to epandrium. Female 4th and 5th terga membranous; 6th abdominal tergite and sternite fused, forming completely annular somite. Spermathecae 2+2 Tribe Prosochaetini, new tribe

THE TAXONOMIC POSITION OF THE HUTTONININAE

Tonnoir and Malloch (1928) considered *Huttonina* to be an "aberrant genus" and only tentatively referred it to the family Sciomyzidae. Harrison (1959) considered the genus to be intermediate between the Sapromyzidae (=Lauxaniidae) and the Sciomyzidae. He apparently based this conclusion upon the fact that *Huttonina* possesses an abbreviated anal vein and parallel or slightly convergent postvertical bristles. However, an abbreviated anal vein and convergent postvertical bristles occur in many and diverse groups of cyclorrhaphous Diptera. There is little evidence to indicate that the occurrence of these characters in *Huttonina* and in the Lauxaniidae is due to synapomorphy.

Furthermore, Harrison stated that "the male genitalia are not particularly modified and are comparable to the normal genitalia of both the Sciomyzidae and Sapromyzidae." In the Lauxaniidae, however, the males possess repeatedly branched accessory glands, a character that is apparently peculiar to this family (Sturtevant, 1926; Griffiths, 1972). I examined the male accessory glands in *Huttonina scutellaris* Tonnoir and Malloch and found them to be simple and unbranched. Griffiths (1972) presented evidence that

indicates that the male postabdomen of *Huttonina* approaches more closely that found in the Sciomyzidae than that of the Lauxaniidae. Indeed, he does not believe that the Sciomyzoinea (=Sciomyzoidea + Cremifaniidae + Megamerinidae) and Lauxanioidea are monophyletic. The arrangement of the postabdominal sclerites and the structure of the aedeagus are fundamentally different in the two groups.

Hennig (1965) supported the view that *Huttonina* is more closely related to the Sciomyzidae than to the Lauxaniidae. He suggested that the fusion of the sixth tergite to the protandrium may be a synapomorphous condition of the Huttonininae and Sciomyzinae. It is now apparent, however, that this condition cannot be ascribed to the groundplan of either subfamily because there are members of both subfamilies in which the sixth tergite of the male is found in its plesiomorphous, "free" state (*Prosochaeta prima* among the Huttonininae; *Pteromicra* spp. and *Pherbellia albocostata* (Fallén) among the Sciomyzinae). This character, therefore, cannot be used to support the contention that the Huttonininae and Sciomyzinae constitute a monophyletic taxon.

Griffiths (1972) removed *Huttonina* and *Prosochaeta* from the Sciomyzidae and referred them to his family Helosciomyzidae along with the Helosciomyzinae (*Helosciomyza*, *Xenosciomyza*, and *Polytocus*). He supported his decision by stating that the Helosciomyzidae are characterized in their groundplan by five conditions that are apomorphous with respect to the groundplans of the Sciomyzoinea and Muscoidea: (1) postvertical bristles parallel to slightly convergent; (2) male 6th tergite reduced, less than one-third length of 5th tergite; (3) vestiges of male 7th and 8th tergites lost and 7th right spiracle lying at margin of 8th sternite; (4) male 7th left spiracle lying within 7th sternite; and (5) aedeagus bilobed distally. I have already pointed out that conditions (1) and (5) are of doubtful value for supporting the view that the Helosciomyzidae are a monophyletic group. Condition (3) cannot be considered a groundplan condition for the Helosciomyzidae or the Huttonininae because the seventh tergite of the male is retained in *Prosochaeta*, and the seventh right spiracle lies within this tergite (Fig. 1). Condition (2) also occurs in other families of Sciomyzoidea; on its own it does not support the argument that the Helosciomyzidae are a monophyletic group. Only condition (4) seems to support the argument for monophyly. Among the other Sciomyzoidea the same condition is found only in the Phaeomyiinae (=Phaeomyiidae *sensu* Griffiths). The taxonomic position of the Huttonininae remains uncertain.

The Sciomyzoidea have never been satisfactorily characterized as a monophyletic group on the basis of apomorphous conditions. The group is maintained primarily as a taxonomic convenience because there is no evidence that the included taxa are more closely related to taxa outside the

Sciomyzoidea. The same can be said of the Sciomyzidae *sensu* Steyskal. Although the taxon consisting of the Sciomyzinae and Salticellinae (=Sciomyzidae *sensu* Griffiths) appears to be well characterized as a monophyletic group (Knutson et al., 1970; Griffiths, 1972), the placement and relationships of the Huttonininae, Helosciomyzinae and Phaeomyiinae remain uncertain. Knutson et al. (1970) expressed the opinion that the group consisting of the Sciomyzinae, Salticellinae, and Phaeomyiinae is monophyletic. The fact that in these subfamilies the clypeus is separated from the epistoma by a large membranous area and is not visible in profile when the proboscis is withdrawn may support their opinion. The Helosciomyzinae are the only sciomyzids with rows of large costal spines and an anteroventral extension of the epandrium (lacking in some species of *Helosciomyza* and in *Xenosciomyza prima* Tonnoir and Malloch). These apomorphic characters may indicate affinities with other families of Sciomyzoidea that also show one or both of the characters, but further investigation is required. It may be of interest that the suture between the first and second abdominal segments is indistinct in the Huttonininae. Elsewhere in the Sciomyzoidea this condition is known only in the Dryomyzidae and Sepsidae (McAlpine, 1963).

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LITERATURE CITED

- Griffiths, G. C. D. 1972. The phylogenetic classification of Diptera Cyclorrhapha, with special reference to the structure of the male postabdomen. Ser. Entomol. (The Hague) 8:1-340.
- Harrison, R. A. 1959. Acalypterate Diptera of New Zealand. N.Z. Dept. Sci. Ind. Res. Bull. 128:1-382.
- Hennig, W. 1958. Die Familien der Diptera Schizophora und ihre phylogenetischen Verwandtschaftsbeziehungen. Beitr. Entomol. 8:505-688.
- . 1965. Die Acalypratae des Baltischen Bernsteins und ihre Bedeutung für die Erforschung der phylogenetischen Entwicklung dieser Dipteren-Gruppe. Stuttg. Beitr. Naturkd. 145:1-215.
- Knutson, L. V., J. W. Stephenson, and C. O. Berg. 1970. Biosystematic studies of *Salticella fasciata* (Meigen), a snail-killing fly (Diptera: Sciomyzidae). Trans. R. Entomol. Soc. Lond. 122:81-100.
- Malloch, J. R. 1935. New Zealand Muscidae Acalypratae: Sciomyzidae; Addendum. Rec. Canterbury Mus. 4:95-96.
- McAlpine, J. F. 1963. Relationships of *Cremifania* Czerny (Diptera: Chamaemyiidae) and description of a new species. Can. Entomol. 95:239-253.

- Steyskal, G. C. 1965. The subfamilies of Sciomyzidae of the world (Diptera: Acalypratae). *Ann. Entomol. Soc. Am.* 58:593-594.
- Sturtevant, A. H. 1926. The seminal receptacles and accessory glands of the Diptera, with special reference to the Acalypterae. *J. N.Y. Entomol. Soc.* 34:1-21.
- Tonnoir, A. L. and J. R. Malloch. 1928. New Zealand Muscidae Acalypratae: Part IV.—Sciomyzidae. *Rec. Canterbury Mus.* 3:151-179.